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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/256,227 02/24/99 KISO S 35.C13358

005514 MM91/0726
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EXAMINER

BROPHY, J

ART UNIT

PAPER NUMBER

2822

DATE MAILED:

07/26/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/256,227

Applicant(s)

KISO ET AL.

Examiner

J. L. Brophy

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed 5/21/01.

Claim Objections

Claim 19 is objected to because of the following informalities: in line 2, "adhesion" should be --adhesive--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi et al (6,097,100) in view of Ohta et al (5,641,997).

Eguchi et al teach an encapsulant resin having an additive dissolved therein (col. 3, lines 52-54 and col. 4, lines 42-46). Re claims 16 and 19, Eguchi et al teach that the additive may be a silane coupling agent for enhancing the adhesive properties of the encapsulant (col. 7, lines 54-57).

However, Eguchi et al do not teach that the additive has a gradient concentration in the direction of thickness of the encapsulant resin.

Ohta et al teach a semiconductor element (5) encapsulated with an encapsulant resin (2), wherein an additive (18) distributed in the encapsulant resin has a

concentration gradient in the direction of the thickness of the encapsulant resin (Fig. 4 and 5 and col. 10, line 55 through col. 11, line 8). Ohta et al teach that the concentration of the additive is higher at a location near the semiconductor element but lower at a location remote from the semiconductor element (col. 18, lines 34-38). Ohta et al teach that the concentration of the additive is lower at a location near the semiconductor element but higher at a location remote from the semiconductor element (Fig. 5 and col. 17, lines 55-58).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method taught by Eguchi et al by dissolving the additive in the encapsulant resin in such a way that the additive has a concentration gradient wherein the concentration of the additive is either greater near the semiconductor element or lower near the semiconductor element in order to improve a property which is improved when the additive exists in the resin layer of a chip side without deteriorating a property which is deteriorated when the additive exists at an outer surface of the device (see Ohta et al, col. 3, lines 49-58 and col. 1, lines 41-59).

Claims 1, 14-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi et al in view of Ishikawa et al (5,656,098).

Eguchi et al teach an encapsulant resin having an additive dissolved therein (col. 3, lines 52-54 and col. 4, lines 42-46). Re claims 16 and 19, Eguchi et al teach that the additive may be a silane coupling agent for enhancing the adhesive properties of the encapsulant (col. 7, lines 54-57).

However, Eguchi et al do not teach that the additive has a gradient concentration in the direction of thickness of the encapsulant resin.

Ishikawa et al teach a semiconductor element (1104b) encapsulated with an encapsulant resin (1101a, 1101b, 1101c), wherein an additive (1102a, 1102b) distributed in the encapsulant resin has a concentration gradient in the direction of the thickness of the encapsulant resin (Fig. 11 and col. 25, line 50 through col. 26, line 47). Ishikawa et al teach that the semiconductor element is a photovoltaic element (col. 25, line 42). Ishikawa et al teach that the concentration of the additive is higher at a location near the semiconductor element but lower at a location remote from the semiconductor element (Fig. 11).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method taught by Eguchi et al by dissolving the additive in the encapsulant resin in such a way that the additive has a concentration gradient wherein the concentration of the additive is either greater near the semiconductor element or lower near the semiconductor element in order to improve a property which is improved when the additive exists in the resin layer of a chip side without deteriorating a property which is deteriorated when the additive exists at an outer surface of the device.

Response to Arguments

Applicant's arguments with respect to claims 1 and 14-19 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. L. Brophy whose telephone number is (703) 308-6182. The examiner can normally be reached on M-Th (7:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

J.L.B.

jlb
July 24, 2001

Carl Whitehead, Jr.
CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
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